Astronomy teaching and the Natural Sciences formative itineraries

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Introduction

In Brazil, Astronomy, due to its relevance and multidisciplinary character, has its concepts worked out throughout the stages that make up Basic Education, in the disciplines of Natural Sciences, under the theme "Universe, Earth, and Life." However, despite being present in the official documents that guide this stage of education, many studies point to a shallow approach in the classroom, mainly reflecting the teacher's training and lack of quality teaching material.

In this context, the reform introduced by the National Common Curricular Base (BNCC in Portuguese language) established a new organization in the High School stage, proposing curricular flexibility with the creation of formative itineraries linked to areas of knowledge, among them, Natural Sciences and its Technologies.

The itineraries allow students to delve deeper into specific knowledge of a particular area and, in this sense, it is believed that they can rescue Astronomy in High School.

Objective

This study aims to present a proposal to resume the teaching of Astronomy as an independent discipline in High School, through a formative itinerary. This is an Instructional Design of a Natural Sciences formative itinerary, to work on the teaching of Astronomy, in the hybrid format, as an independent discipline in High School, lasting one semester.

Teaching Astronomy and the BNCC

In Brazil, the contents related to the study of Astronomy are diluted in practically all levels of education, although not as an independent discipline (BARBOZA; VOELZKE, 2016), the contents are worked under the theme “Universe, Earth and life”, within the six structuring themes of Physics Teaching (BRAZIL, 2002). However, several kinds of research in the Astronomy education area show that the contents are minimally treated in Basic Education, in Kindergarten, Elementary, and High School (LANGHI; NARDI, 2009).

Even with this distance observed in these studies, the reform that instituted the BNCC reaffirmed the importance of teaching Astronomy as one of the specific competencies of the area of Natural Sciences and its Technologies.

The formative itinerary of Astronomy

In planning the itinerary, an open model was chosen, which presents flexibility in its organization, allowing the teacher to assume the planning, mediation, and evaluation process. Considering that the BNCC brought in its text the possibility of carrying out activities at a distance of up to 20% of the total workload of this stage (BRAZIL, 2018), the proposal uses technological mediation through a virtual environment. The initial analysis phase sought to address, from a pedagogical point of view, the scope of the offer, with data referring to the objective, workload, duration, and target audience. Data from this phase were summarized in Table 1.

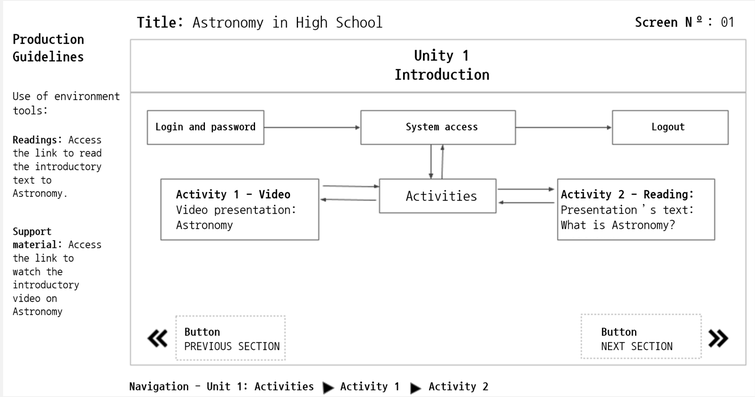
Table 1: Itinerary data

Itinerary name	Astronomy in High School	
Objective	Bringing Astronomy content to High School students within the Natural Sciences formative itinerary	
Workload	Presential	24 hours/class
	On-line	8 hours/class
Length	16 weeks (one academic semester)	
Target Audience	2nd and 3rd year High School students	

Source: prepared by the authors

In the implementation, three Instructional Design resources were used, which are: **the activities map**, **the Instructional Design matrix** and **the Storyboard**, which aims to provide a script in the form of tables with guidelines for the development of the online part of the itinerary as shown in Figure 1.

Figure 1: Unit 1 Storyboard



Source: prepared by the authors

Final considerations

Due to its multidisciplinary character, the teaching of Astronomy is of relevant importance in the formation of the young protagonist and, in this perspective, despite the distancing and absence of Astronomy in Basic Education (EB) verified by several authors (LANGHI; NARDI, 2009; ALBRECHT ; VOELZKE, 2011), the reform introduced by the National Common Curricular Base (BRAZIL, 2018) brought a range of options to work on these contents in High School.

Certainly, the implementation of training itineraries within this flexible curriculum perspective, in this sense, requires a deeper discussion.

In this sense, the Astronomy formative itinerary provides the teacher with an initial, guiding model that allows him to work on the contents from the perspective of an independent discipline in High School, with a hybrid approach that opens the possibility of using digital technologies managed by a platform of virtual teaching. It is expected, therefore, that the proposal, due to its originality, provides a base material that contributes so that teachers can work on teaching Astronomy at High School as an independent discipline, through a Natural Sciences formative itinerary.

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